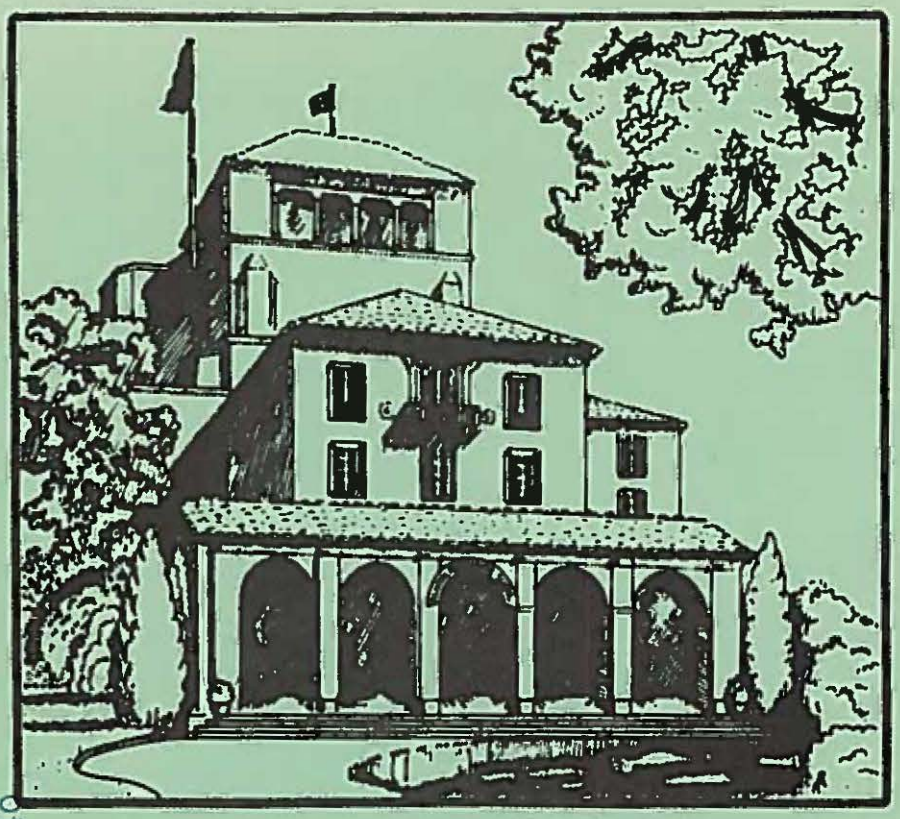
1972-05-22

Naval Postgraduate School Faculty Bulletin, 1972-05-22

Monterey, California, Naval Postgraduate School



Naval Postgraduate School

FACULTY BULLETIN

ISSUE NO. 6-72

22 May 1972

DEAN'S LIST

The Dean's List for Quarter III, Academic Year 1971-72, shows 223 students who have attained a 3.65 grade point average or above. Students enrolled during the quarter numbered 1633.

GRADUATION

Twelve of the 167 March graduates were awarded the Master's Degree with Distinction. Students graduating with distinction were enrolled in the following curricula:

Operations Research	4
Oceanography	1
Meteorology	3
Aeronautical Engineering	2
Electrical Engineering	2

Three students received the degree of Electrical Engineer and two students received the degree of Mechanical Engineer.

PROFESSIONAL ACTIVITIES

Professor Sydney R. Parker attended the 1972 International Symposium on Circuit Theory in Los Angeles, California. He was General Chairman of the meeting and in addition presented a paper entitled "Synthesis of Digital Filters from Frequency Spectrum Characteristics" with A. L. Partarrieu, Chilean Navy and G. E. Sharpe, former Visiting Associate Professor at the Naval Postgraduate School.

On April 18th Professor S. R. Parker was the organizer and lecturer for a short course on "Digital Filters" at the Stanford Linear Accelerator Center, sponsored by the Institute of Electrical and Electronic Engineers, San Francisco Section.

On April 28th Professor Parker was guest lecturer at the University of Notre Dame 1972 Spring Colloquium. His topic was entitled "Open Questions in Digital Filters."

Dr. H. Paul Ecker, Executive Director, NMSC, attended the 8th NATO Defense Planning Workshop in Rome on 17 April. His presentation was entitled, "Developing Resource Management Educational Programmes." On April 24 in Brussels he addressed the NATO Ambassadors.

Professor Ecker's book "Handbook for Supervisors" has been translated into Spanish by Editorial Diana, S. A. of Mexico, D. F. The title is Manual Para Supervisores.

On April 21, Professor H. Medwin presented a paper to the Acoustical Society of America meeting in Buffalo, NY. The paper was co-authored with LCDR J. Rautmann, Federal German Navy, and was titled "Sound-speed Dispersion and Fluctuations in Coastal Ocean Waters." This research is a part of a joint project with Professors Poston and Thornton of the Oceanography Department. The results reported uproot a firmly held fallacy that the speed of sound in sea water is independent of frequency.

FACULTY PUBLICATIONS

Parker, S. R. and Sigurd F. Hess.

Heuristic Bounds for the Frequency of Digital Oscillators due to Quantisation Noise. Electronic Letters, 24th February 1972, Vol. 8, No. 4, pp. 86-87.

Abstract: This paper uses a deterministic approach to evaluate bounds for the frequency of digital oscillators considering either round-off or magnitude truncation quantisation.

Cooper, T. E. and Trezek, G. J.

A probe technique for determining the thermal conductivity of tissue. Journal of Heat Transfer. Paper No. 70-WA/HT-18.

Abstract: A small, needle-like probe has been developed for determining the thermal conductivity of either in-vivo or in-vitro biological tissue. Experimentally obtained results are presented for in-vitro human kidney, liver, spleen, heart, whole brain, brain gray matter and brain white matter. In-vivo conductivity data for canine liver, with and without blood flow, are also presented.

Von Schwind, J. J. and Reid, R. O.

Characteristics of gravity waves of permanent form. Journal of Physical Research, Vol. 77, No. 3, January 1972, pp. 420-433.

Abstract: A conformal transformation of the equations constituting the boundary value problem of permanent form finite gravity waves from the x, y-plane to the velocity potential-stream function plane is presented. Fourier coefficients of the solution to this problem are determined for a representative sampling of theoretical waves and comparison is made with existing theories.

Ball, R. E. and W. C. Stilwell.

Buckling of Shallow Spherical Caps and Truncated Hemispheres. AIAA Journal, Vol. 10, No. 3, March, 1972, pp 241-242.

Abstract: Buckling of shallow spherical shells and truncated hemispheres subjected to nearly axisymmetric loads is studied. Small asymmetric perturbations in the load are used to disclose the minimum bifurcation buckling loads and to illuminate the imperfection-sensitivity of the shells.

Ball, R. E.

A Program for the Nonlinear Static and Dynamic Analysis of Arbitrarily Loaded Shells of Revolution.

Computers and Structures, Vol. 2, 1972, pp. 141-162.

Abstract: A digital computer program for the geometrically non-linear static and dynamic response of arbitrarily loaded shells of revolution is described. Results from the program are compared to previously published data for several problems, and the versatility, efficiency, and limitations of the program are candidly evaluated.

Read, R. R.

The asymptotic inadmissibility of the sample distribution function. The Annals of Mathematical Statistics, Vol. 43, No. 1, 1972, pp. 89-95.

Abstract: It is shown that the risk (expected squared error) of the usual estimator (proportion of observations less than or equal to x) for a distribution is about c/n^2 too large for admissibility. The Pyke estimator serves in this dominating role and support is given to its use.

Williams, R. T.

Quasi-geostrophic versus non-geostrophic frontogenesis. Journal of Atmospheric Sciences, Vol. 29, No. 1, January 1972, pp. 3-10.

Abstract: This study examines frontogenesis which is forced by a nondivergent horizontal wind field which contains stretching deformation. The linear of nonlinear primitive equations are solved numerically and the solutions are compared. The nonlinear solutions are much more realistic and they imply the formation of discontinuities within a finite period of time.

Chan, S. P., Chan, S. Y., and Chan, S. G.

Analysis of Linear Network and Systems, A Matrix-Oriented Approach with Computer Applications. 1972, pp. 635, Addison-Wesley Co., Reading, Mass.

Abstract: This text gives a unified treatment of matrix formulation of network equations. State-variable method is used as a bridge joining together the two theories--namely, the circuit concept and the system concept. Computer-aided network analysis is introduced and supported by a number of computer programs presently stored in the NPS Computer Center.

Garrison, C. J. and Berklite, R. B.

"Hydrodynamic Loads Induced by Earthquakes," OTC Paper #1554, Proceedings of the Fourth Annual Offshore Technology Conference, May 1972.

Abstract: Bottom mounted structures of large displacement immersed in the sea experience large hydrodynamic loads in addition to inertia loads during an earthquake. In this paper, a theoretical approach to the calculation of these hydrodynamic loads is outlined and numerical results are presented for several submerged and semi-submerged configurations. It is concluded that the proximity of the free surface has a large effect on the induced loads and, in general, tend to reduce the loads in comparison to the infinite depth case.

Garrison, C. J. and Chow, P. Y.

"Forces exerted on a submerged Oil Storage Tank by Surface Waves," OTC Paper #1555, Proceedings of the Fourth Annual Offshore Technology Conference, May 1972.

Abstract: This paper deals with the interaction of a train of regular waves with a large submerged object of arbitrary shape in water of finite depth. Linear wave theory is used to describe the incident wave and the scattering potential is represented by use of a Green's function. Numerical Results for both horizontal and vertical force coefficient are compared with experimental results from wave channel testing.

Medwin, H. and Hagy, J. D. LCDR, USN.

Helmholtz-Kirchhoff Theory for Sound Transmission through a Statistically Rough Plane Interface between Dissimilar Fluids. Journal of the Acoustical Society of America, March 1972.

Abstract: The dependence of sound transmission on the statistics of a randomly rough interface between two dissimilar fluids is studied by use of the Kirchhoff-Helmholtz integral. Both plane waves and waves from a point source are considered. The analysis is very similar to that of scatter from a randomly rough surface; for example, for low roughness, the transmitted mean-square pressure is coherent and e^{-R} times the smooth surface value, whereas for large roughness the transmitted sound is incoherent and depends also on the surface correlation length. The critical roughness parameter for transmission is $R=k_2^2\sigma^2[(c_2/c_1)\cos\theta_1-\cos\theta_2]^2$ where k, c, and θ are the propagation constant, speed of propagation, and angle with the normal, respectively; subscript 1 refers to the incident medium; σ is the rms height of the surface. The paper represents the first theoretical study of the effect of the rough ocean surface in altering the spectrum of sound transmitted from ASW aircraft into the water.

RESEARCH AWARDS

The following is a list of sponsored research funds received by the Naval Postgraduate School during the period 1 April through 30 April 1972. The projects indicated by asterisks are continuations of existing programs.

Source	Amount	Title	Principal Investigator
Naval Ship Systems Command Washington, D. C.	$12,500	Nonlinear Parametric Generational Reception of Sound	Asst Prof A. I. Eller Physics
U.S.A. Small Arms Systems Agency Aberdeen Proving Ground, Md.	20,000	Effectiveness Methodology for Small Arms Weapon Systems	Asst Prof J. G. Taylor Operations Research and Administrative Sciences
Naval Electronics Laboratory Center San Diego, Calif.	4,850	Evaluation of Adequacy of Converse Grammar for Use in a Demonstration Model of the FISAR System	Asst. Prof. G. D. Gibbons Mathematics
Naval Research Laboratory Washington D. C.	27,100	Ultrasonic Image Camera Tube	Assoc. Prof G. L. Sackman Electrical Engineering
Naval Electronics Laboratory Center San Diego, Calif.	4,700	Analysis of Linear Predictive Algorithms	Asst Prof A. M. Shorb Mathematics

Source	Amount	Title	Principal Investigator
Annapolis Laboratory Naval Ship Research and Development Center Annapolis, Maryland	5,000	Research in Ship Control Systems	Prof G. J. Thaler Assoc Prof M. L. Wilcox Electrical Engineering
Naval Ordnance Station Indian Head, Maryland	10,000	*Axisymetric Analysis of Heat Addition	Prof A. E. Fuhs Aeronautics
Annapolis Laboratory Naval Ship Research and Development Center Annapolis, Maryland	2,000	Steering and Diving Control Systems Analysis	Assoc Prof R. H. Nunn Mechanical Engineering
Naval Electronics Laboratory Center San Diego, Calif.	4,700	Functional Module Architecture	Asst Prof V. M. Powers Electrical Engineering
Naval Weapons Center China Lake, Calif.	4,300	Technical Analysis of High Energy Laser Program	Asst Prof J. P. Powers Electrical Engineering
Chief of Naval Research Arlington, Virginia	6,000	Probability Models for Reliability Analysis	Assoc Prof J. D. Esary Operations Research and Administrative Science
Naval Weapons Laboratory Dahlgren, Virginia	12,000	Prediction Error Study of MARK GFCS	Assoc Prof H. A. Titus Electrical Engineering

TRAVEL ORDERS WRITTEN 24 APRIL - 12 MAY

Supported by Research Funds:

Titus, H. A.	4/28-4/29	Moffett Field	Visit Tactical Support Center & P-3 Aircraft
Fuhs, A. E.	6/11-6/17	Colorado Springs	Attend 39th PEP AGARD Mtg at Air Force Academy
Kodres, U. R. Terman, F. W.	5/10-5/14	Wash, D.C.	Give presentation at British-U. S. Navy Exchange Mtg to discuss Command & Control Problems
Sovereign, M. G.	5/31-6/1	Wash, D.C.	Work with Patrol Frigate Project
Boston, N.E.J.	5/3-5/7	S. Diego	Discuss acquisition and analyses of turbulence data at Scripps Inst. of Oceanography.
Schwirzke, F.R.	6/6-6/11	Rochester, NY	Present paper at AFOSR Contractors' Mtg.
Denner, W.W.	5/31-6/12	Auckland NZ S Diego	Attend conf on Oceanic Microstructure at UC San Diego; discuss research & equipment at NPS.
Denner, W.W.	4/25-5/5	Auckland, NZ Gisborne, NZ	Participate in sound propagation experiment.
Franke, R.	5/1-7/1	San Diego	Conduct research at NELC.
Rahe, G.A.	5/14-5/19	Atlantic City Wash, D.C.	Att. Exec. Mtgs of Simulation Council; confer w/research sponsors.
Titus, H.A.	5/11-5/13	Moffett Field San Diego	Visit TSC; briefing on 14E19 Trainer at Fleet ASW School; briefings at NURDC.
Jolly, J. A.	5/14-5/28	Lansing & Ann Arbor Washington, DC Ottawa, Canada	Consultations; present paper at Int'l Microwave Power Inst. Symp.
Gibbons, G.D.	5/15-5/16	LA	Inspect CONVERSE System.

Nunn, R. H.	6/13-6/17	Northridge Ca	Att 1972 Heat Transfer & Fluid Mechanics Inst.
Marto, P.J.	6/17-7/31	Wash DC	Participate in NavShips/NPS Faculty Liaison Program.
Hunter, W.N.	5/12-5/16	Ft Belvoir	Mtg & discussion on System X
Titus, H.A.	5/15-5/17	Moffett Field	Take part in a P3ASW Flight

Supported by BuPers Funds:

Hoverland, H.A.	5/6-5/7	Hayward	Att Mtg of Amer Acct Assn
Jones, C.R.	5/2-5/9	Pittsburgh	Recruiting at Carnegie-Mellon Univ & att. Annual Mtg of Public Choice Society.
Hess, R.A.	5/16-5/20	Ann Arbor	Present paper at U. of Mich. 8th Ann Conf on Manual Control Systems
Stolfi, R.H.	5/7-5/10	Wash, DC	Foundation Res Project & consultation.
Forrest, R.N. Lindsay, G. F.	5/2-5/6	Wash, DC	Att ONR Symp on Methods & Anal. of Fleet Tactical Effectiveness and Performance.
Hering, C.A.	5/2-5/5	SFran	Att ISA Analysis Instrumentation Div. Symp.
Lockhart, B.J.	5/26-5/27	Stockton	Represent NPS at Inaugural Ceremony at U. of Pacific.
Andrews, R. S. Wickham, J.B.	5/11-5/17 5/22-5/28	USNS Bartlett	Research.
Heinz, O.	5/12-5/13	Livermore Ca	Visit Lawrence Radiation Lab.
Bomberger, R.B.	6/12-6/18	Glenview, Ill Norfolk, VA	Att 8th Ann Type Comm. Safety Conf; faculty updating trip.
Wible, L.C.	5/18-5/20	Alameda	Field Trip.

Edwards, G.R.	6/11-6/19	Tilton, N.H.	Att Gordon Conf on Physical Metallurgy.
Elsberry, R.L.	5/21-5/27	Wash, DC	Present paper at Int'l Conf on Aero space and Aeronautical Meteorology
Kennedy, J.E.	5/14-5/25	Pensacola Norfolk	Faculty Updating.
Marks, H.B.	6/13-6/17	San Diego	Att. Summer Simulation Conf.
Galt, J.A.	5/22-5/28	USNS Bartlett	Participation in oceanographic cruise.

No cost to the Government:

Fuhs, A. E.	6/4-6/7	Dayton, Ohio	Att. mtg of Nat'l Academy of Sciences/AFSC Propulsion Panel.
Houlihan, T.M. Cooper, T.E. Nunn, R.H.	4/28-4/30	Santa Clara	Att ASME Graduate Student Contest U. of Santa Clara
Ault, D.A.	4/27-4/29	Turlock, Ca	Give talk at Stanislaus State Coll.
Bach, R.E.	6/19-8/27	Moffett Field	Work at NASA-Ames during intersessional period.
Menneken, C.E.	5/17-5/22	Wash, D.C.	Att mtg of Mine Advisory Comm.; Visit Systems Commands.
Geist, J.M.	5/15-5/17	Moffett Field	Take part in a P3 ASW flight.